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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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# PETITION FOR REVIVAL OF AN APPLICATION FOR PATENT ABANDONED UNINTENTIONALLY UNDER 37 CFR 1.137(b)

Docket Number (Optional)
501558.20003

First named inventor: Hiroto Sugahara

Application No.: 10/679,531

Art Unit: 2853

Filed: October 6, 2003

Examiner: Mruk, Geoffrey S.

Title: Pressure Producing Apparatus

OIPE
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JUL 10 2006
PATENT & TRADEMARK OFFICE

Attention: Office of Petitions
**Mail Stop Petition**
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
FAX (571) 273-8300

NOTE: If information or assistance is needed in completing this form, please contact Petitions Information at (571) 272-3282.

The above-identified application became abandoned for failure to file a timely and proper reply to a notice or action by the United States Patent and Trademark Office. The date of abandonment is the day after the expiration date of the period set for reply in the office notice or action plus an extensions of time actually obtained.

APPLICANT HEREBY PETITIONS FOR REVIVAL OF THIS APPLICATION

NOTE: A grantable petition requires the following items:
(1) Petition fee;
(2) Reply and/or issue fee;
(3) Terminal disclaimer with disclaimer fee - required for all utility and plant applications filed before June 8, 1995; and for all design applications; and
(4) Statement that the entire delay was unintentional.

1. Petition fee
☐ Small entity-fee $ ________ (37 CFR 1.17(m)). Applicant claims small entity status. See 37 CFR 1.27.
☑ Other than small entity – fee $ 1,500.00 (37 CFR 1.17(m))

2. Reply and/or fee
A. The reply and/or fee to the above-noted Office action in the form of a copy of the reply previously submitted. (identify type of reply):
☐ has been filed previously on ________________________.
☑ is enclosed herewith.

B. The issue fee and publication fee (if applicable) of $ ___________.
☐ has been paid previously on ________________________.
☐ is enclosed herewith.

07/12/2006 WABDELR1 00000018 10679531
01 FC:1453 1500.00 OP

This collection of information is required by 37 CFR 1.137(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

3. Terminal disclaimer with disclaimer fee

☑ Since this utility/plant application was filed on or after June 8, 1995, no terminal disclaimer is required.

☐ A terminal disclaimer (and disclaimer fee (37 CFR 1.20(d)) of $ ________ for a small entity or $ ________ for other than a small entity) disclaiming the required period of time is enclosed herewith (see PTO/SB/63).

4. STATEMENT: The entire delay in filing the required reply from the due date for the required reply until the filing of a grantable petition under 37 CFR 1.137(b) was unintentional. [NOTE: The United States Patent and Trademark Office may require additional information if there is a question as to whether either the abandonment or the delay in filing a petition under 37 CFR 1.137(b) was unintentional (MPEP 711.03(c), subsections (III)(C) and (D)).]

**WARNING:**

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

| | |
|---|---|
| Signature | July 10, 2006<br>Date |
| Eugene LeDonne<br>Typed or printed name | 35,930<br>Registration Number, if applicable |
| 599 Lexington Avenue, 29th Floor<br>Address | 212.521.5400<br>Telephone Number |
| New York, NY 10022<br>Address | |

Enclosures:
☑ Fee Payment
☑ Reply
☐ Terminal Disclaimer Form
☑ Additional sheets containing statements establishing unintentional delay
☐ Other:________

CERTIFICATE OF MAILING OR TRANSMISSION [37 CFR 1.8(a)]

I hereby certify that this correspondence is being:

☒ Deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Mail Stop Petition, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.

☐ Transmitted by facsimile on the date shown below to the United States Patent and Trademark Office as (571) 273-8300.

7-10-06
Date

Signature

RUTH MONTALVO
Typed or printed name of person signing certificate

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CERTIFICATE OF MAILING

I hereby certify that this paper (along with any document referred to as being attached or enclosed) is being:

| **EXPRESS MAIL NO. EL 962 857 699 US** | **FACSIMILE** |
|---|---|
| ☒ deposited with the United States Postal Service on July 10, 2006, with sufficient postage as Express Mail in an envelope addressed to Commissioner for Patents, PO Box 1450, Alexandria, VA 22313. | ☐ transmitted by facsimile on [date] to the U.S. Patent and Trademark Office. |
| Ruth Montalvo | Type Signature Name Here |
| (Signature of person mailing paper or fee) | (Signature of person mailing paper or fee) |

In the event that this paper is filed late and a necessary Petition for an Extension of Time is not concurrently filed herewith, please consider this as a Petition for the requisite extension of time, and, to the extent not tendered by check attached hereto, authorization to charge the extension fee, or any other fee required in connection with this paper, to Deposit Account No. 50-1529.

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

**Hiroto Sugahara**

Serial No.: 10/679,531

Filed: October 6, 2003

Art Unit: 2853

Examiner: Mruk, Geoffrey S.

Confirmation No.: 3968

Atty. Docket No.: 501558.20003

**PRESSURE PRODUCING APPARATUS**

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Commissioner for Patents
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Alexandria, VA 22313-1450

## STATEMENTS IN SUPPORT OF PETITION TO REVIVE UNDER 37 C.F.R. § 1.137(B)

S I R:

In response to the Notice of Abandonment dated June 20, 2006, Applicant hereby submits the following statements in support of its Petition To Revive Under 37 C.F.R. § 1.137(B).

07/12/2006 WABDELR1 00000018 10679531
02 FC:1462 400.00 DP

# REMARKS

The Examiner has notified Applicant that the current application has become abandoned for failure to timely file a proper reply to the Office letter mailed on July 8, 2005. The entire delay in filing the required reply from the due date of Tuesday, October 11, 2005, until the filing of this Petition to Revive under 37 C.F.R. § 1.137(b) was unintentional. As such, Applicant hereby petitions that the current application be revived as unintentionally abandoned pursuant to 37 C.F.R. § 1.137(b).

## I. EXPLANATION OF FACTS

On July 8, 2005, the Examiner mailed a non-final Office Action to Applicant's attorneys of record. A copy of the July 8, 2005 Office Action is attached hereto as Exhibit A.

A response to this Office Action was due on Saturday, October 8, 2005. Being that October 8, 2005 was a Saturday, the due date for the response was extended to Monday, October 8, 2005. Being that Monday, October 10, 2005 was a holiday (Columbus Day), the due date for the response was further extended to Tuesday, October 11, 2005.

On Tuesday, October 11, 2005, a Response to the Office Action was filed, via Express Mail, No. EV 398 733 730 US, at the USPTO. The USPTO acknowledged receipt of the Response on Tuesday, October 11, 2005 via a date-stamped return post card. A copy of the Response along with a copy of the USPTO date-stamped return postcard, are attached hereto as Exhibit B.

The Response contained 31 claims. Since 23 claims had already been paid for, a fee for the 8 additional claims was due. Applicant's attorneys, however, unintentionally forgot include a check for these additional claims or authorize the USPTO to charge any fees required in connection with the Response to Deposit Account No. 50-1529.

The USPTO's online PAIR system indicates that a Notice of Additional Fee Due and a Fee Worksheet (PTO-875) were generated and given a Mail Room Date of Thursday, October 20, 2005. However, no indication is given that these two items were ever mailed. Moreover, Applicant's attorneys never received the Notice of Additional Fee Due. A copy of both of the Notice of Additional Fee Due and the Fee Worksheet (PTO-875) are attached hereto as Exhibit C.

On Thursday, December 8, 2005, a telephonic interview was held between Applicant's attorney Bala Sundararajan and examiners Geoffrey Mruk and Manish Shah. An Interview Summary was subsequently mailed to Applicant's attorneys on Monday, December 12, 2005. A copy of the Interview Summary is attached hereto as exhibit D.

On June 20, 2006, the USPTO issued a Notice of Abandonment for failure to timely file a proper reply to the Office letter mailed on July 8, 2005. A copy of the Notice of Abandonment is attached hereto as Exhibit E.

## II. REQUEST TO REVIVE AS UNINTENTIONALLY ABANDONED

The entire delay in filing the required reply from the due date of Tuesday, October 11, 2005, until the filing of this Petition to Revive under 37 C.F.R. § 1.137(b) was unintentional.

Applicant has filed, concurrently with this Petition to Revive, the appropriate excess claims fee for eight claims of $400.00 and the appropriate Petition to Revive as unintentionally abandoned fee under 37 C.F.R. § 1.17(m) of $1,500.00.

In the event that this paper is filed late and a necessary Petition for an Extension of Time is not concurrently filed herewith, please consider this as a Petition for the requisite extension of time, and, to the extent not tendered by check attached hereto, authorization to charge the extension fee, or any other fee required in connection with this paper, to Deposit Account No. 50-1529.

As a result of the unintentional abandonment of the current application, Applicant hereby petitions under 37 C.F.R. § 1.137(b) that the current application be revived.

Based upon the above remarks, Applicant respectfully requests revival of this application, reconsideration of this application, and its early allowance. Should the Examiner feel that a telephone conference with Applicant's attorney would expedite the prosecution of this application, the Examiner is urged to contact him at the number indicated below.

Respectfully submitted,

Eugene LeDonne – Reg. No. 35,930
REEDSMITH LLP
599 Lexington Avenue
New York, NY 10022
Tel.: 212.521.5400

ED:JWT

501558.20003

UNITED STATES PATENT AND TRADEMARK OFFICE

OIPE IAP79
JUL 10 2006
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UNITED STATES DEPARTMENT OF COMMERCE
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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/679,531 | 10/06/2003 | Hiroto Sugahara | 501558.20003 | 3968 |

26418 7590 07/08/2005

REED SMITH, LLP
ATTN: PATENT RECORDS DEPARTMENT
599 LEXINGTON AVENUE, 29TH FLOOR
NEW YORK, NY 10022-7650

| EXAMINER | |
|---|---|
| MRUK, GEOFFREY S | |
| **ART UNIT** | **PAPER NUMBER** |
| 2853 | |

DATE MAILED: 07/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

DOCKET

FZD DUE Oct. 8, 2005 Reply Due
Jan. 8, 2006 Deadline

PTO-90C (Rev. 10/03)

OIPE JUL 10 2006 PATENT & TRADEMARK OFFICE

| Office Action Summary | Application No. | Applicant(s) |
|---|---|---|
| | 10/679,531 | SUGAHARA, HIROTO |
| | **Examiner** | **Art Unit** |
| | Geoffrey Mruk | 2853 |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *27 May 2005*.
2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-23* is/are pending in the application.
  4a) Of the above claim(s) *7,11-19 and 23* is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1-6, 8-10, and 20-22* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on *06 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.
  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  a)☒ All b)☐ Some * c)☐ None of:
    1.☒ Certified copies of the priority documents have been received.
    2.☐ Certified copies of the priority documents have been received in Application No. _____.
    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
  * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
  Paper No(s)/Mail Date *6 October 2003*.
4) ☐ Interview Summary (PTO-413)
  Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

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## DETAILED ACTION

### *Election/Restrictions*

Claims 7, 11-19, and 23 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 27 May 2005.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Takuchi et al. (US 5,592,042).

With respect to claim 1, Takuchi discloses a pressure producing apparatus (Fig. 10, Column 1, lines 11-19), comprising:

- a sheet member (Fig. 10, element 6a) which is formed of a piezoelectric material (Column 6, lines 56-65);
- at least one first electrode (Fig. 10, element 4) which is embedded (Column 6, line 61) in one of a first portion (Fig. 10, interface between elements 2 and 6a) and a second portion (Fig. 10, interface between elements 6a and 16) of the sheet member, the first portion and the second portion being opposite to each

other in a direction of thickness (perpendicular to the plane of element 2) of the sheet member; and

- at least one second electrode (Fig. 10, element 4, i.e. electric field between strips described in Column 5, lines 1-9) which is embedded in said one of the first and second portions of the sheet member, such that said at least one second electrode is opposed to said at least one first electrode (array of element 4) in a surface direction parallel to one of a first surface of the first portion and a second surface of the second portion (parallel to the plane of element 2), the first surface and the second surface being opposite to each other in the direction of thickness of the sheet member (perpendicular to the plane of element 2).

With respect to claim 2, Takuchi discloses at least one first electrode (Fig. 10, element 4) and said at least one second electrode (Fig. 10, element 4, i.e. electric field between strips described in Column 5, lines 1-9) are embedded (Column 6, line 61) in said one of the first (Fig. 10, interface between elements 2 and 6a) and second portions (Fig. 10, interface between elements 6a and 16) of the sheet member (Fig. 10, element 6a), such that said at least one first electrode and said at least one second electrode extend from said one of the first and second surfaces of the first and second portions of the sheet member (Fig. 10, i.e. array of element 4 embedded in element 6a) in the direction of thickness (perpendicular to the plane of element 2) thereof.

With respect to claim 3, Takuchi discloses a portion of said one of the first and second portions of the sheet member (Fig. 10, element 6a) that is located between said at least one first electrode (Fig. 10, element 4) and said at least one second electrode

(Fig. 10, element 4) is polarized in the surface direction (Column 3, lines 37-39, i.e. longitudinal mode) in which said at least one first electrode and said at least one second electrode are opposed to each other, so as to provide an active portion, and wherein when an electric field is applied to the active portion of the sheet member in a same direction as the direction of polarization of the active portion, the sheet member is curved (Column 5, lines 1-9) in the direction of thickness thereof because of a difference between an amount of elongation in the surface direction of said one of the first and second portions of the sheet member in which said at least one first electrode and said at least one second electrode are provided and an amount of elongation in the surface direction of the other of the first and second portions in which said at least one first electrode and said at least one second electrode are not provided (Column 1, lines 21-59, i.e. strain developed due to the piezoelectric effect).

With respect to claim 4, Takuchi discloses a plurality of said first electrodes and a plurality of said second electrodes (Fig. 10, array of element 4), wherein the first and second electrodes are embedded (Column 6, line 61) in a limited portion of said one of the first and second portions of the sheet member that is limited in the surface direction.

With respect to claim 5, Takuchi discloses a plurality of groups of said first electrodes (Fig. 2, element 4) and a plurality of groups of said second electrodes (Fig. 2, element 4, i.e. voltage applied between electrode strips), wherein the plurality of groups of first electrodes are arranged along a plurality of concentric first circles, respectively, and the plurality of groups of second electrodes are arranged along a plurality of concentric second circles, respectively, and wherein the first and second circles are concentric with each other and the groups of first electrodes and the groups of second electrodes are alternate with each other in a radial direction of the concentric first and second circles (Column 5, lines 10-23).

With respect to claim 6, Takuchi discloses a plurality of groups of said first electrodes (Fig. 1, array of element 4) and a plurality of groups of said second electrodes (Fig. 1, array of element 4, i.e. electric field between strips described in Column 5, lines 1-9), wherein the plurality of groups of first electrodes are arranged along a plurality of first lines, respectively, and the plurality of groups of second electrodes are arranged along a plurality of second lines, respectively, and wherein the groups of first electrodes and the groups of second electrodes are alternate with each other in a direction intersecting the first and second lines (Column 1, lines 36-63).

With respect to claim 10, Takuchi discloses the first portion (Fig. 10, interface between elements 2 and 6a) of the sheet member (Fig. 10, element 6a) comprises a first sheet member, which is formed of the piezoelectric material (Column 6, lines 56-65);

- wherein said at least one first electrode (Fig. 10, element 4) is embedded (Column 6, line 61) in the first sheet member;
- wherein said at least one second electrode (Fig. 10, element 4, i.e. electric field between strips described in Column 5, lines 1-9) is embedded in the first sheet member such that said at least one second electrode is opposed to said at least one first electrode in the surface direction parallel (parallel to the plane of element 2) to a first surface of the first sheet member; and

- wherein the second portion (Fig. 10, interface between elements 6a and 16) of the sheet member comprises a second sheet member (Column 7, lines 64-67; Column 8, lines 1-20) which is stacked on the first sheet member and resists elongation (Since element 6a of Fig. 10 contains areas where there are no electrodes present, resistance to strain will occur due to the absence of the piezoelectric effect) of the first sheet member in the surface direction that occurs when an electric field is applied (Column 5, lines 1-9), in the surface direction, to a portion of the first sheet member that is located between said at least one first electrode and said at least one second electrode.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Usui et al. (US 5,255,016) in view of Takuchi et al. (US 5,592,042).

With respect to claim 1, the primary reference Usui discloses a pressure producing apparatus (Column 1, lines 51-64) comprising:

- a sheet member (Fig. 1, element 14), element which is formed of a piezoelectric material (Column 3, line 15);

- at least one first electrode (Fig. 1, element 17), a first portion (Fig. 1, element 14a) and a second portion (Fig. 1, surface opposite element 14a in the Y-direction) of the sheet member the first portion and second portion of the sheet member being opposite to each other in a direction of thickness (Fig. 3a, Y-direction) of the sheet member;
- and at least one second electrode (Fig. 1, element 18) such that said at least one second electrode is opposed to said at least one first electrode in a surface direction parallel (Fig. 3a, Z-direction) to one of a first surface of the first portion and a second surface of the second portion, the first surface and the second surface being opposite to each other in the direction of thickness of the sheet member.

With respect to claim 8, Usui discloses the apparatus further comprises a liquid-chamber defining member which cooperates with the other of the first and second surfaces of the sheet member (Fig. 1, element 14) that does not correspond to said one of the first and second portions to define a liquid chamber in which a liquid is accommodated, and wherein the apparatus changes a pressure of the liquid accommodated in the liquid chamber (Column 3, lines 22-39).

With respect to claim 9, Usui discloses a plurality of groups of said first electrodes and a plurality of groups of said second electrodes (Fig. 1, elements 17, 18, i.e. electrode pattern), wherein the liquid-chamber defining member includes at least one partition wall (Fig. 1, element 13) which cooperates with said other of the first and second surfaces of the sheet member to define a plurality of liquid chambers in each of which the liquid is accommodated, wherein the plurality of groups of first electrodes and the plurality of groups of second electrodes are provided in a plurality of limited portions of said one of the first and second portions of the sheet member, respectively, that are aligned with the plurality of liquid chambers, respectively (Column 3, lines 22-39).

However, Usui fails to disclose at least one first electrode, which is embedded in said one of a first portion and a second portion of the sheet member; and at least one second electrode which is embedded in said one of the first and second portions of the sheet member.

The secondary reference Takuchi discloses a pressure producing apparatus (Fig. 10, Column 1, lines 11-19), comprising:

- a sheet member (Fig. 10, element 6a) which is formed of a piezoelectric material (Column 6, lines 56-65);
- at least one first electrode (Fig. 10, element 4) which is embedded (Column 6, line 61) in one of a first portion (Fig. 10, interface between elements 2 and 6a) and a second portion (Fig. 10, interface between elements 6a and 16) of the sheet member, the first portion and the second portion being opposite to each other in a direction of thickness of the sheet member; and
- at least one second electrode (Fig. 10, element 4, i.e. electric field between strips described in Column 5, lines 1-9) which is embedded in said one of the first and second portions of the sheet member, such that said at least one second electrode is opposed to said at least one first electrode (array of element 4) in a surface direction parallel to one of a first surface of the first portion and a second

surface of the second portion (parallel to the plane of element 2), the first surface and the second surface being opposite to each other in the direction of thickness of the sheet member (perpendicular to the plane of element 2).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to use the piezoelectric/electrostrictive actuator of Takuchi in the ink jet printer recording head of Usui. The motivation for doing so would have been:

- "The present actuator can be driven by applying a voltage in the direction parallel to the plane of the substrate, namely, without a voltage applied in the direction of thickness of the substrate. Accordingly, the present actuator may use a relatively thin layer of piezoelectric or electrostrictive material to form the piezoelectric/electrostrictive portion and/or layer, since a potential defect or flaw of the piezoelectric or electrostrictive film is less likely to lower the dielectric breakdown voltage or cause shear stresses between the electrode strips and the piezoelectric or electrostrictive material" (Column 3, lines 47-57).
- "The present actuator is constructed to lower the required level of the drive voltage by reducing the distance between the adjacent electrode strips, i.e., the width of the piezoelectric or electrostrictive material between the adjacent electrode strips, rather than reducing the thickness of the piezoelectric or electrostrictive material of the piezoelectric/electrostrictive portion" (Column 3, lines 58-64).
- "Furthermore, the cellular structure of the piezoelectric/electrostrictive portion whose local areas are disposed between the adjacent electrode strips is less

likely to be influenced by a difference in the heat expansion coefficient between the substrate material and the piezoelectric or electrostrictive material, whereby the amount of displacement or force produced by the actuator can be accurately controlled by the drive voltage" (Column 4, lines 3-10).

2. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Usui et al. (US 5,255,016) in view of Takuchi et al. (US 5,592,042).

With respect to claim 20, the primary reference Usui discloses a pressure producing apparatus (Column 1, lines 51-64), comprising:

- a sheet member (Fig. 1, element 14) which is formed of a piezoelectric material (Column 3, line 15);
- at least one first electrode (Fig. 1, element 17), the first portion (Fig. 1, element 14a) and the second portion (Fig. 1, surface opposite element 14a in the Y-direction) being opposite to each other in a direction of thickness (Fig. 3, Y-direction) of the sheet member;
- at least one second electrode (Fig. 1, element 18) , such that said at least one second electrode is opposed to said at least one first electrode in a surface direction parallel (Fig. 3a, Z-direction) to a first surface of the first portion and a second surface of the second portion that are opposite to each other in the direction of thickness of the sheet member;

- and a liquid-chamber defining member which cooperates with one of the first and second surfaces of the sheet member (Fig. 1, element 14) to define a liquid chamber in which a liquid is accommodated (Column 3, lines 22-39),
- wherein an electric field (Fig. 3a, element E) is applied between said at least one first electrode and said at least one second electrode, so as to produce a difference between an amount of elongation in the surface direction of the first portion of the sheet member and an amount of elongation in the surface direction of the second portion of the sheet member and thereby curve the sheet member in the direction of thickness thereof and change a pressure of the liquid accommodated in the liquid chamber (Column 3, lines 46-68: Column 4, lines 1-26).

With respect to claim 21, the primary reference Usui discloses the liquid chamber of the liquid-chamber defining member accommodates an ink as the liquid (Column 3, lines 22-39), and wherein the apparatus further comprises a nozzle-defining member (Fig. 1, element 11) which defines a nozzle (Fig. 1, element 12) which communicates with the liquid chamber and ejects a droplet of the ink when the sheet member is curved in the direction of thickness thereof to change the pressure of the ink accommodated in the liquid chamber.

With respect to claim 22, the primary reference Usui discloses a sheet member (Fig. 1, element 14),

- at least one first electrode (Fig. 1, element 17);

- at least one second electrode (Fig. 1, element 18), such that said at least one second electrode is opposed to said at least one first electrode in a surface direction parallel (Fig. 3a, Z-direction) to a first surface of the first sheet member and a second surface of the second sheet member that are apart from, and opposite to, each other in respective directions of thickness (Fig. 3a, Y-direction) of the first and second sheet members; and
- a liquid-chamber defining member which cooperates with one of the first and second surfaces of the first and second sheet members to define a liquid chamber in which a liquid is accommodated (Column 3, lines 22-39),
- wherein an electric field (Fig. 3a, element E)is applied between said at least one first electrode and said at least one second electrode, so as to produce a difference between an amount of elongation in the surface direction of the first sheet member and an amount of elongation in the surface direction of the second sheet member and thereby curve the first and second sheet members in the respective directions of thickness thereof and change a pressure of the liquid accommodated in the liquid chamber (Column 3, lines 46-68: Column 4, lines 1-26).

However, Usui fails to disclose a first sheet member and a second sheet member which are stacked on each other and at least one of which is formed of a piezoelectric material; at least one first electrode which is embedded in said at least one of the first sheet member and the second sheet member; at least one second electrode which is embedded in said at least one of the first sheet member and the second sheet member.

The secondary reference Takuchi discloses the first portion (Fig. 10, interface between elements 2 and 6a) of the sheet member (Fig. 10, element 6a) comprises a first sheet member, which is formed of the piezoelectric material (Column 6, lines 56-65);

- wherein said at least one first electrode (Fig. 10, element 4) is embedded (Column 6, line 61) in the first sheet member;
- wherein said at least one second electrode (Fig. 10, element 4, i.e. electric field between strips described in Column 5, lines 1-9) is embedded in the first sheet member such that said at least one second electrode is opposed to said at least one first electrode in the surface direction parallel (parallel to the plane of element 2) to a first surface of the first sheet member; and
- wherein the second portion (Fig. 10, interface between elements 6a and 16) of the sheet member comprises a second sheet member (Column 7, lines 64-67; Column 8, lines 1-20) which is stacked on the first sheet member and resists elongation (Since element 6a of Fig. 10 contains areas where there are no electrodes present, resistance to strain will occur due to the absence of the piezoelectric effect) of the first sheet member in the surface direction that occurs when an electric field is applied (Column 5, lines 1-9), in the surface direction, to a portion of the first sheet member that is located between said at least one first electrode and said at least one second electrode.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to use the piezoelectric/electrostrictive actuator of Takuchi in the ink jet printer recording head of Usui. The motivation for doing so would have been:

- "The present actuator can be driven by applying a voltage in the direction parallel to the plane of the substrate, namely, without a voltage applied in the direction of thickness of the substrate. Accordingly, the present actuator may use a relatively thin layer of piezoelectric or electrostrictive material to form the piezoelectric/electrostrictive portion and/or layer, since a potential defect or flaw of the piezoelectric or electrostrictive film is less likely to lower the dielectric breakdown voltage or cause shear stresses between the electrode strips and the piezoelectric or electrostrictive material" (Column 3, lines 47-57).
- "The present actuator is constructed to lower the required level of the drive voltage by reducing the distance between the adjacent electrode strips, i.e., the width of the piezoelectric or electrostrictive material between the adjacent electrode strips, rather than reducing the thickness of the piezoelectric or electrostrictive material of the piezoelectric/electrostrictive portion" (Column 3, lines 58-64).
- "Furthermore, the cellular structure of the piezoelectric/electrostrictive portion whose local areas are disposed between the adjacent electrode strips is less likely to be influenced by a difference in the heat expansion coefficient between the substrate material and the piezoelectric or electrostrictive material, whereby

the amount of displacement or force produced by the actuator can be accurately controlled by the drive voltage" (Column 4, lines 3-10).

## *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Geoffrey Mruk whose telephone number is (571) 272-2810. The examiner can normally be reached on 7am - 330pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**Stephen D. Meier**
**Primary Examiner**

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7/1/2005

GM

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*(use as many sheets as necessary)*

| Sheet | 1 | of | 1 |
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**Complete if Known**

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| Application Number | Unknown 10/679531 |
| Filing Date | October 6, 2003 |
| First Named Inventor | Hiroto Sugahara |
| Art Unit | Unknown 2853 |
| Examiner Name | Unknown Geoffrey Mruk |
| Attorney Docket Number | 501558.20003 |

## U.S. PATENT DOCUMENTS

| Examiner Initials* | Cite No. [1] | Document Number<br>Number - Kind Code [2] (if known) | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear |
|---|---|---|---|---|---|
| GM | | US-2002/0024567A1 | 02/28/2002 | Takagi | |
| GM | | US-6,536,880 B2 | 03/25/2003 | Takagi | |
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## FOREIGN PATENT DOCUMENTS

| Examiner Initials* | Cite No. [1] | Foreign Patent Document<br>Country Code [3] -Number [4] - Kind Code [5] (if known) | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear | T [6] |
|---|---|---|---|---|---|---|
| GM | | JP 2002-59547 | 02/26/2002 | Takagi | | ✓ |
| GM | | JP 2002-127420 | 05/08/2002 | Takagi | | ✓ |
| GM | | JP 6-316070 | 11/15/1994 | Takabayashi, et al. | | ✓ |

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|---|---|---|---|
| Examiner Signature | Geoffrey Mruk | Date Considered | 6/28/2005 |

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

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| ***Notice of References Cited*** | Application/Control No.<br>10/679,531 | Applicant(s)/Patent Under Reexamination<br>SUGAHARA, HIROTO | |
| | Examiner<br>Geoffrey Mruk | Art Unit<br>2853 | Page 1 of 1 |

**U.S. PATENT DOCUMENTS**

| * | | Document Number Country Code-Number-Kind Code | Date MM-YYYY | Name | Classification |
|---|---|---|---|---|---|
| | A | US-5,255,016 | 10-1993 | Usui et al. | 347/71 |
| | B | US-5,592,042 | 01-1997 | Takuchi et al. | 310/328 |
| | C | US- | | | |
| | D | US- | | | |
| | E | US- | | | |
| | F | US- | | | |
| | G | US- | | | |
| | H | US- | | | |
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**NON-PATENT DOCUMENTS**

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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
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# NEW CENTRAL FAX NUMBER

Effective July 15, 2005

On July 15, 2005, the Central FAX Number will change to **571-273-8300**. This new Central FAX Number is the result of relocating the Central FAX server to the Office's Alexandria, Virginia campus.

Most facsimile-transmitted patent application related correspondence is required to be sent to the Central FAX Number. To give customers time to adjust to the new Central FAX Number, faxes sent to the old number (703-872-9306) will be routed to the new number until September 15, 2005. After September 15, 2005, the old number will no longer be in service and **571-273-8300** will be the only facsimile number recognized for "centralized delivery".

CENTRALIZED DELIVERY POLICY: For patent related correspondence, hand carry deliveries must be made to the Customer Service Window (now located at the Randolph Building, 401 Dulany Street, Alexandria, VA 22314), and facsimile transmissions must be sent to the Central FAX number, unless an exception applies. For example, if the examiner has rejected claims in a regular U.S. patent application, and the reply to the examiner's Office action is desired to be transmitted by facsimile rather than mailed, the reply must be sent to the Central FAX Number.

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501558.20003 EXPRESS MAIL # EV 398 733 730 US
October 11, 2005

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| **Applicant:** | Hiroto Sugahara |
| **Serial No.:** | 10/679,531 |
| **Filed:** | October 6, 2003 |
| **Title:** | Pressure Producing Apparatus |

**Receipt is hereby acknowledged of:**

(1) Amendment to Office Action

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501558.20003 EXPRESS MAIL # EV 398 733 730 US

October 11, 2005

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|---|---|
| **Applicant:** | **Hiroto Sugahara** |
| **Serial No.:** | **10/679,531** |
| **Filed:** | **October 6, 2003** |
| **Title:** | **Pressure Producing Apparatus** |

**Receipt is hereby acknowledged of:**

(1) Amendment to Office Action

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Hiroto Sugahara

Application No. 10/679,531

Filed: October 6,2003

Art Unit: 2853

Examiner: Geoffrey S. Mruk

Atty. Docket No.: 501558.20003

Customer No.: 026148

**PRESSURE PRODUCING APPARATUS**

Commissioner for Patents
Alexandria, VA 22313

Sir:

## AMENDMENT UNDER 37 CFR § 1.111

This Amendment is responsive to the Office Action dated July 8, 2005 (herein referred to as "the Office Action" or "this Office Action").

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 10 of this paper.

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| ☒ deposited with the United States Postal Service on October 11, 2005, with sufficient postage as Express Mail, No. EV 398 733 730 US, in an envelope addressed to MS **Amendment**, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.<br>Ruth Montalvo<br>Ruth Montalvo<br>(Signature of person mailing paper or fee) | ☐ transmitted by facsimile on [date] to the U.S. Patent and Trademark Office.<br>Type Signature Name<br>(Signature of person mailing paper or fee) |

IN THE CLAIMS:

1. (Currently Amended) A pressure producing apparatus, comprising:

a sheet member which is formed of a piezoelectric material;

~~at least one~~ a plurality of first ~~electrode~~ electrodes which ~~is~~ are embedded in a first area of one of a first portion and a second portion of the sheet member, such that the first electrodes are separate from each other in the first area, the first portion and the second portion being opposite to each other in a direction of thickness of the sheet member; and

~~at least one~~ a plurality of second ~~electrode~~ electrodes which ~~is~~ are embedded in a second area of said one of the first and second portions of the sheet member, such that ~~said at least one second electrode is opposed to said at least one first electrode~~ the second electrodes are separate from each other in the second area, the second area being adjacent to the first area in a surface direction parallel to one of a first surface of the first portion and a second surface of the second portion, the first surface and the second surface being opposite to each other in the direction of thickness of the sheet member.

2. (Currently Amended) The pressure producing apparatus according to claim 1, wherein ~~said at least one~~ the first ~~electrode~~ electrodes and ~~said at least one~~ the second ~~electrode~~ electrodes are embedded in said one of the first and second portions of the sheet member, such that ~~said at least one~~ the first ~~electrode~~ electrodes and ~~said at least one~~ the second ~~electrode~~ electrodes extend from said one of the first and second surfaces of the first and second portions of the sheet member in the direction of thickness thereof.

3. (Currently Amended) The pressure producing apparatus according to claim 1, wherein ~~a~~ a plurality of portions of said one of the first and second portions of the sheet member that ~~is~~ are located between ~~said at least one~~ the plurality of first electrodes and ~~said at least one~~ the plurality of second electrodes ~~is~~ are polarized in the surface direction ~~in which said at least one first electrode and said at least one second electrode are opposed to each other,~~ so as to provide ~~an~~ a plurality of active portions, and wherein when an electric field is applied to each of the active portions of the sheet member in a same direction as the direction of polarization of ~~the~~ said each active portion, the sheet member is curved in the direction of thickness thereof because of a difference between an amount of elongation in the surface direction of said one of the first and second portions of the sheet member ~~in which said at least one first electrode and said at least one second electrode are provided~~ and an amount of

elongation in the surface direction of the other of the first and second portions. ~~in which said at least one first electrode and said at least one second electrode are not provided.~~

4. (Currently Amended) The pressure producing apparatus according to claim 1, ~~comprising a plurality of said first electrodes and a plurality of said second electrodes,~~ wherein the first and second electrodes are embedded in a limited portion of said one of the first and second portions of the sheet member that is limited in the surface direction.

5. (Currently Amended) The pressure producing apparatus according to claim ~~1~~ 28, ~~comprising~~ wherein the first electrodes comprise a plurality of groups of ~~said~~ first electrodes and the second electrodes comprise a plurality of groups of ~~said~~ second electrodes, wherein the plurality of groups of first electrodes are arranged along a plurality of concentric first circles as a plurality of said first lines, respectively, and the plurality of groups of second electrodes are arranged along a plurality of concentric second circles as a plurality of said second lines, respectively, and wherein the first and second circles are concentric with each other and the groups of first electrodes and the groups of second electrodes are alternate with each other in a radial direction of the concentric first and second circles.

6. (Currently Amended) The pressure producing apparatus according to claim ~~1~~ 28, ~~comprising~~ wherein the first electrodes comprise a plurality of groups of ~~said~~ first electrodes and the second electrodes comprise a plurality of groups of ~~said~~ second electrodes, wherein the plurality of groups of first electrodes are arranged along a plurality of first straight lines as a plurality of said first lines, respectively, and the plurality of groups of second electrodes are arranged along a plurality of second straight lines as a plurality of said second lines, respectively, and wherein the groups of first electrodes and the groups of second electrodes are alternate with each other in a direction intersecting the first and second straight lines.

7. (Withdrawn) The pressure producing apparatus according to claim 4, wherein the sheet member has, in said one of the first and second surfaces thereof that corresponds to said one of the first and second portions thereof, a plurality of recesses which cooperate with each other to at least partly surround the limited portion of said one of the first and second portions in which the first and second electrodes are provided.

8. (Original) The pressure producing apparatus according to claim 1, wherein the apparatus further comprises a liquid-chamber defining member which cooperates with the other of the first and second surfaces of the sheet member that does not correspond to said one of the first and second portions to define a liquid chamber in which a liquid is accommodated, and wherein the apparatus changes a pressure of the liquid accommodated in the liquid chamber.

9. (Currently Amended) The pressure producing apparatus according to claim 8, ~~comprising~~ wherein the first electrodes comprise a plurality of groups of ~~said~~ first electrodes and the second electrodes comprise a plurality of groups of said second electrodes, wherein the liquid-chamber defining member includes at least one partition wall which cooperates with said other of the first and second surfaces of the sheet member to define a plurality of liquid chambers in each of which the liquid is accommodated, and wherein the plurality of groups of first electrodes and the plurality of groups of second electrodes are provided in a plurality of limited portions of said one of the first and second portions of the sheet member, respectively, that are aligned with the plurality of liquid chambers, respectively.

10. (Currently Amended) The pressure producing apparatus according to claim 1, wherein the first portion of the sheet member comprises a first sheet member ~~which is formed of the piezoelectric material, wherein said at least one~~ and the first ~~electrode is~~ electrodes are embedded in the first sheet member, wherein ~~said at least one~~ the second ~~electrode is~~ electrodes are embedded in the first sheet member ~~such that said at least one second electrode is opposed to said at least one first electrode in a the surface direction parallel to a the first surface of the first sheet member~~, and wherein the second portion of the sheet member comprises a second sheet member which is stacked on the first sheet member and resists elongation of the first sheet member in the surface direction that occurs when an electric field is applied, in the surface direction, to a plurality of portions of the first sheet member that ~~is~~ are located between said at least one first electrodes ~~and said at least one~~ the second electrodes.

11. (Withdrawn – Currently Amended) The pressure producing apparatus according to claim 10, wherein ~~said at least one~~ the first electrodes and ~~said at least one~~ the second electrodes are embedded in the first sheet member such that the first electrodes and

the second electrodes extend from the first surface of the first sheet member in a direction of thickness thereof.

12. (Withdrawn – Currently Amended) The pressure producing apparatus according to claim 11, wherein ~~said at least one~~ the first electrodes and ~~said at least one~~ the second electrodes extend through the thickness of the first sheet member.

13. (Withdrawn – Currently Amended) The pressure producing apparatus according to claim 10, ~~comprising a plurality of said first electrodes and a plurality of said second electrodes,~~ wherein the first electrodes and the second electrodes are embedded in a limited portion of the first sheet member that is limited in the surface direction.

14. (Withdrawn – Currently Amended) The pressure producing apparatus according to claim ~~10~~ 29, ~~comprising~~ wherein the first electrodes comprise a plurality of groups of ~~said~~ first electrodes and the second electrodes comprise a plurality of groups of ~~said~~ second electrodes, wherein the plurality of groups of first electrodes are arranged along a plurality of concentric first circles as a plurality of said first lines, respectively, and the plurality of groups of second electrodes are arranged along a plurality of concentric second circles as a plurality of said second lines, respectively, and wherein the first and second circles are concentric with each other and the groups of first electrodes and the groups of second electrodes are alternate with each other in a radial direction of the concentric first and second circles.

15. (Withdrawn – Currently Amended) The pressure producing apparatus according to claim ~~10~~ 29, ~~comprising~~ wherein the first electrodes comprise a plurality of groups of said first electrodes and the second electrodes comprise a plurality of groups of ~~said~~ second electrodes, wherein the plurality of groups of first electrodes are arranged along a plurality of first straight lines as a plurality of said first lines, respectively, and the plurality of groups of second electrodes are arranged along a plurality of second straight lines as a plurality of said second lines, respectively, and wherein the groups of first electrodes and the groups of second electrodes are alternate with each other in a direction intersecting the first and second straight lines.

16. (Withdrawn) The pressure producing apparatus according to claim 13, wherein the first sheet member has, in the first surface thereof opposite to the second sheet member, a plurality of recesses which at least partly surround the limited portion of the first sheet member in which the first and second electrodes are embedded.

17. (Withdrawn) The pressure producing apparatus according to claim 16, wherein the plurality of recesses comprise a plurality of through-holes which are formed through the thickness of the first sheet member.

18. (Withdrawn – Currently Amended) The pressure producing apparatus according to claim 10, further comprising a liquid-chamber defining member which cooperates with ~~a~~ the second surface of the second sheet member that is opposite to the first sheet member to define a liquid chamber in which a liquid is accommodated, and wherein the apparatus changes a pressure of the liquid accommodated in the liquid chamber.

19. (Withdrawn – Currently Amended) The pressure producing apparatus according to claim 18, ~~comprising~~ wherein the first electrodes comprise a plurality of groups of ~~said~~ first electrodes and the second electrodes comprise a plurality of groups of ~~said~~ second electrodes, wherein the liquid-chamber defining member includes at least one partition wall which cooperates with the second surface of the second sheet member to define a plurality of liquid chambers in each of which the liquid is accommodated, and wherein the plurality of groups of first electrodes and the plurality of groups of second electrodes are provided in a plurality of limited portions of the first sheet member, respectively, that are aligned with the plurality of liquid chambers, respectively.

20. (Currently Amended) A pressure producing apparatus, comprising:

a sheet member which is formed of a piezoelectric material;

~~at least one~~ a plurality of first electrodes of a plurality of first electrodes which ~~is~~ are embedded in a first area at least one of a first portion and a second portion of the sheet member, such that the first electrodes are separate from each other in the first area the first portion and the second portion being opposite to each other in a direction of thickness of the sheet member;

~~at least one~~ a plurality of second electrodes which ~~is~~ are embedded in a second area of said at least one of the first and second portions of the sheet member, such that ~~said at~~

~~least one second electrode is opposed to said at least one first electrode~~ the second electrodes are separate from each other in the second area, the second area being adjacent to the first area in a surface direction parallel to a first surface of the first portion and a second surface of the second portion that are opposite to each other in the direction of thickness of the sheet member; and

a liquid-chamber defining member which cooperates with one of the first and second surfaces of the sheet member to define a liquid chamber in which a liquid is accommodated,

wherein an electric field is applied between ~~said at least one~~ the first electrodes and ~~said at least one~~ the second electrodes, so as to produce a difference between an amount of elongation in the surface direction of the first portion of the sheet member and an amount of elongation in the surface direction of the second portion of the sheet member and thereby curve the sheet member in the direction of thickness thereof and change a pressure of the liquid accommodated in the liquid chamber.

21. (Original) The pressure producing apparatus according to claim 20, wherein the liquid chamber of the liquid-chamber defining member accommodates an ink as the liquid, and wherein the apparatus further comprises a nozzle-defining member which defines a nozzle which communicates with the liquid chamber and ejects a droplet of the ink when the sheet member is curved in the direction of thickness thereof to change the pressure of the ink accommodated in the liquid chamber.

22. (Currently Amended) The pressure producing apparatus accordingly to claim 20, wherein the first portion and the second portion of the sheet member comprise~~s~~ a first sheet member and a second sheet member, respectively, which are stacked on each other ~~and at least one of which is formed of a piezoelectric material~~, wherein ~~said at least one~~ the first ~~electrode is~~ electrodes are embedded in said at least one of the first sheet member and the second sheet member,~~such that said at least one second electrode is opposed to said at least one first electrode in a the surface direction parallel to a first surface of the first sheet member and a second surface of the second sheet member that are apart from, and opposite to, each other in respective directions of thickness of the first and second sheet members,~~ wherein the liquid-chamber defining member cooperates with one of the first and second surfaces of the first and second sheet members to define ~~a~~ the liquid chamber in which ~~a~~ the liquid is accommodated, and wherein ~~a~~ the electric field is applied between ~~said at least~~ the one first

electrodes and ~~said at least one~~ the second electrodes, so as to produce a difference between an amount of elongation in the surface direction of the first sheet member and an amount of elongation in the surface direction of the second sheet member and thereby curve the first and second sheet members in the respective directions of thickness thereof and change the pressure of the liquid accommodated in the liquid chamber.

23. (Withdrawn) The pressure producing apparatus according to claim 22, wherein the liquid chamber of the liquid-chamber defining member accommodates an ink as the liquid, and wherein the apparatus further comprises a nozzle-defining member which defines a nozzle which communicates with the liquid chamber and ejects a droplet of the ink when the first and second sheet members are curved in the directions of thickness thereof to change the pressure of the ink accommodated in the liquid chamber.

24. (New) The pressure producing apparatus according to claim 1, wherein the plurality of first electrodes comprise a plurality of groups of first electrodes each group of which include at least two first electrodes and are embedded in a corresponding one of a plurality of said first areas of said one of the first portion and the second portion of the sheet member, such that said at least two first electrodes are separate from each other in said corresponding first area, and the plurality of second electrodes comprise a plurality of groups of second electrodes each group of which includes at least two second electrodes and are embedded in a corresponding one of a plurality of said second areas of said one of the first and second portions of the sheet member, such that said at least two second electrodes are separate from each other in said corresponding second area, and wherein the plurality of first areas and the plurality of second areas are arranged alternately with each other in the surface direction.

25. (New) The pressure producing apparatus according to claim 24, wherein each of the plurality of first areas and the plurality of second areas has an elongate shape.

26. (New) The pressure producing apparatus according to claim 24, wherein each of the plurality of first areas and the plurality of second areas has an annular shape.

27. (New) The pressure producing apparatus according to claim 20, wherein the plurality of first electrodes comprise a plurality of groups of first electrodes each group of which include at least two first electrodes and are embedded in a corresponding one of a plurality of said first areas of said at least one of the first portion and the second portion of the sheet member, such that said at least two first electrodes are separate from each other in said corresponding first area, and the plurality of second electrodes comprise a plurality of groups of second electrodes each group of which includes at least two second electrodes and are embedded in a corresponding one of a plurality of said second areas of said at least one of the first and second portions of the sheet member, such that said at least two second electrodes are separate from each other in said corresponding second area, and wherein the plurality of first areas and the plurality of second areas are arranged alternately with each other in the surface direction.

28. (New) The pressure producing apparatus according to claim 1, wherein the first electrodes are arranged along a first line in the first area and the second electrodes are arranged, in the second area, along a second line which is separate from, and opposed to, the first line in the surface direction.

29. (New) The pressure producing apparatus according to claim 20, wherein the first electrodes are arranged along a first line in the first area and the second electrodes are arranged, in the second area, along a second line which is separate from, and opposed to, the first line in the surface direction.

30. (New) The pressure producing apparatus according to claim 1, wherein each of the first and second electrodes has a columnar shape having a substantially constant cross-section area in a direction parallel to an axis line thereof, and is embedded in said one of the first and second portions of the sheet member such that the axis line of said each electrode extends substantially parallel to the direction of thickness of the sheet member.

31. (New) The pressure producing apparatus according to claim 30, wherein said each of the first and second electrodes has a cylindrical shape as said columnar shape.

## REMARKS

Claims 1-23 are currently pending in the application. Claims 7, 11-19, and 23 are withdrawn from consideration. Claims 1-6 and 10 stand rejected under 35 U.S.C. § 102(b). Claims 1, 8, 9, and 20-22 stand rejected under 35 U.S.C. § 103(a). Claims 1-6, 9-15, 18-20 and 22 are amended. Claims 24-31 are added. No new matter is presented. The above amendments and the following remarks are considered by Applicants to overcome each rejection raised by the Examiner and to place the application in condition for allowance. An early Notice of Allowance is therefore requested.

In view of the above amendments and the following remarks, Applicant requests the withdrawal of the rejection of claims 1-6, 8-10, and 20-22 and the favorable consideration of new claims 24-31.

### I. Rejection of Pending Claims 1-6 and 10 under 35 U.S.C. § 102(b)

Claims 1-6 and 10 stand rejected as being anticipated by Takuchi et al. (U.S. Patent No. 5,592,042). This rejection is traversed and believed overcome in view of the following discussion.

#### A. Relevant Law

"A claim is anticipated if each and every limitation is found either expressly or inherently in a single prior art reference." *Bristol-Myers Squibb v. Ben Venue*, 246 F.3d 1368, 1374 (Fed. Cir. 2001). Identity of invention requires that a prior reference disclose to one of ordinary skill in the art all elements and limitations of the patent claim. *Scripps Clinic v. Genentech*, 927 F.2d 1565, 1576 (Fed. Cir. 1991). Absence from the reference of any claimed element negates anticipation. *Kloster Speedsteel AB v. Crucible, Inc.*, 230 USPQ 81 (Fed. Cir. 1986).

#### B. Summary of Cited Reference

Takuchi is directed to a piezoelectric/electrostrictive actuator having a substrate, a plurality of electrodes in the form of strips, and a piezoelectric/electrostrictive portion which is disposed between the adjacent strips of the electrodes in the spacing direction. The strips are formed on at least one surface of the substrate such that the electrode strips are spaced from each other in a direction parallel to the substrate surface. The piezoelectric/electrostrictive portion is disposed between the adjacent strips of the electrodes in the spacing direction, and in contact with the adjacent electrode strips, so that the piezoelectric/electrostrictive portion produces a flexural displacement or force due to the application of voltage between the adjacent electrode strips.

## C. Argument

The Examiner asserts that Takuchi teaches all the features recited in claims 1-6 and 10. Applicants respectfully disagree with the Examiner's analysis.

Since claims 2-6 and 10 depend from independent claim 1, Applicants will address independent claims 1 first.

Takuchi discloses, in Fig. 10, a piezoelectric actuator including a piezoelectric layer 6a and a plurality of electrode strips 4 that are embedded in a first half portion of the piezoelectric layer 6a and do not extend to the remaining, second half portion of the same 6a. The electrode strips 4 include two sorts of electrodes (e.g., positive electrodes and grounded electrodes; or positive electrodes and negative electrodes) that cooperate with each other to produce respective electric fields. The two sorts of electrodes strips 4 are arranged alternately with each other in a longitudinal direction of the actuator.

However, Takuchi does not teach or suggest the subject matter of amended claim 1 (or amended claim 20), providing a plurality of first electrodes which are embedded in a first area of one of a first portion and a second portion of the sheet member, such that the first electrodes are separate from each other in the first area; and a plurality of second electrodes which are embedded in a second area of said one of the first and second portions of the sheet member, such that the second electrodes are separate from each other in the second area, the second area being adjacent to the first area in a surface direction.

Takuchi discloses an actuator having each of the elongate and continuous electrode strips 4 extending over the entire width of the piezoelectric layer 6a or the actuator (See Fig. 1). The respective portions of the above-indicated first half portion of the layer 6a that are sandwiched by respective pairs of adjacent strips 4 are completely separated or isolated from each other by the strips 4. As a result, the strength and durability of the first half portion of the piezoelectric layer 6a of the actuator would be insufficiently low (for example, cracks would be more likely to occur to the first half portion of the layer 6a than to the second half portion of the same 6a).

In contrast, according to the claimed invention, the first electrodes are separate from each other in the first area, and the second electrodes are separate from each other in the second area that is adjacent to the first area in the surface direction. Thus, respective portions of the first or second portion of the piezoelectric sheet member that are sandwiched by one or more pairs of adjacent first electrodes, one or more pairs of adjacent second electrodes, and two or more pairs of adjacent first and second electrodes are continuous with each other. Thus, the first or second portion of the piezoelectric sheet member in which the first and second electrodes are embedded can enjoy high strength and durability.

For the above-indicated reasons, it is respectfully submitted that Takuchi does not anticipate the subject matter of amended claim 1 or any of dependent claims 2-6 and 10. Thus, Applicants respectfully request the withdrawal of the rejection of claims 1-6 and 10 under 35 U.S.C. 102(b) over Takuchi.

## II. Rejection of pending claims 1, 8, 9, and 20 - 22 under 35 U.S.C. 103(a) as being unpatentable over Usui et al. in view of Takuchi et al.

### A. Relevant Law

An Examiner may find each claimed element of an invention in the prior art references but it is not sufficient to establish obviousness of the invention. *In re Rouffet*, 47 USPQ2d 1453 (Fed. Cir. 1998). A determination of obviousness must involve more than an indiscriminate combination of the prior art; there must be some motivation, suggestion, or teaching of the desirability of combining or modifying the references to arrive at the claimed method. *In re Dance*, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998). Further, rejecting claims solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed inventions itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention is "an inappropriate process by which to determine patentability." *Sensonics, Inc. v. Aerosonic Corp.*, 38 USPQ2d 1551 (Fed. Cir. 1996).

### B. Summary of Cited Reference

Usui discloses an ink jet printer recording heard having a plurality of vibrating places. The surface of each vibrating place is integrally provided with a pair of positive and negative comb-type electrodes. When a voltage is applied across the electrodes, the vibrating plates are bent toward the nozzles to pressure the ink.

### C. Argument

The Examiner indicates that combination of the cited references teach or suggest the claimed invention. Moreover, the Examiner takes the position that Usui cures the deficiencies of Takuchi. Specifically, the Examiner states that Usui is silent in regard to the at least one first electrode, which is embedded in one of a first portion and second portion of the sheet member and a second electrode embedded in one of the first and second portions of the sheet member. The Examiner further states that Takuchi discloses the deficiencies of Usui. Applicants traverse the rejection of claims 1, 8, 9 and 20-22 under 35 U.S.C. 103(a).

Usui discloses, in Fig. 1, an inkjet printer recording head including a vibrating plate 14 made of a piezoelectric material; and two sorts of electrodes 17, 18 that are provided on an upper surface 14a of the vibrating plate 14. (See column 3, lines 14-45).

However, as admitted by the Examiner at Page 8, Lines 5-8, of the Office Action, Usui fails to disclose two sorts of electrodes that are embedded in one of two half portions of the piezoelectric plate 14. The two sorts of electrodes 17, 18 are just provided on the upper surface 14a of the piezoelectric plate 14.

In addition, Usui does not compensate for the above-discussed deficiencies of Takuchi et al. The two sorts of electrodes 17, 18 employed by the Usui's recording head shown in Fig. 1 are a continuous positive comb-like electrode and a continuous negative comb-like electrode. Although Usui additionally discloses, in Figs. 4a and 4b, another recording head including first electrodes 17 and second electrodes 18 that are arranged alternately with each other, those two sorts of electrodes 17, 18 are just similar to the electrode strips 4 disclosed by Takuchi (but the electrodes 17, 18 are not embedded in the vibrating plate 14). Thus, even if it may have been obvious to a person skilled in the art to combine Usui with Takuchi, the combination of the cited references fails to teach or suggest all the features cited in amended claims 1 or amended claim 20 or any of the dependent claims 8, 9, 21, and 22. Therefore, Applicants request the withdrawal of the rejection of claims 1, 8, 9, and 20-22 under 35 U.S.C. 103(a).

## III. New Claims

New claims 24-31 are presented. No new matter is presented. With respect to the subject matter of new claims 24 and 27, neither Takuchi et al. nor Usui et al. teaches or suggests providing a plurality of groups of first electrodes each group of which include at least two first electrodes and are embedded in a corresponding one of a plurality of first areas of one of the first portion and the second portion of the piezoelectric layer 6a, such that said at least two first electrodes are separate from each other in said corresponding first area, or a plurality of groups of second electrodes each group of which includes at least two second electrodes and are embedded in a corresponding one of a plurality of second areas of said one of the first and second portions of the layer 6a, such that said at least two second electrodes are separate from each other in said corresponding second area, or arranging the plurality of first areas and the plurality of second areas alternately with each other in the surface direction of the layer 6a.

For at least the above-indicated reasons, Applicants request the favorable consideration of new claims 24-31. we observe that all claims 1-6, 8-10, 20-22, and 24-31, now under consideration, are placed in condition for allowance. Hence, we solicit the Examiner to withdraw the rejections applied to the claims and reconsider the allowability of the same.

## IV. Conclusion

In view of the above amendments and remarks, Applicant submits claims 1-6, 8-10, 20-22, and 24-31, recite subject matter that is neither taught nor suggested by the applied references. Thus, for the reasons presented above, claims 1-6, 8-10, 20-22 and 24-31 are believed by Applicant to define patentable subject matter and should be passed to issue at the earliest possible time. A Notice of Allowance is requested.

Respectfully submitted,

Bala Sundararajan
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REED SMITH LLP
599 Lexington Avenue
New York, NY 10022
(P) 212-521-5449
Attorney for Applicant

OIPE IAP78
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10/679531

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Alexandria, VA 22313-1450
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# NOTICE REQUIRING EXCESS CLAIMS FEES

The excess claim(s) filed on October 11, 2005 is not accompanied by the appropriate payment of excess claims fees set forth in 37 CFR 1.16(h)-(j) or 1.492(d)-(f). Excess claims fees are required for each claim in independent form in excess of three (§ 1.16(h)), each claim (whether dependent or independent) in excess of twenty (note that § 1.75(c) indicates how multiple dependent claims are considered for fee calculation purposes) (§ 1.16(i)), and each application that contains a multiple dependent claim (§ 1.16(j)).

Since the application is not under a final rejection, applicant is given a time period of **ONE (1) MONTH or THIRTY (30) DAYS** from the mailing date of this notice, whichever is longer, to submit either: (1) the fee payment of $400.00, or (2) an amendment in compliance with 37 CFR 1.121 that cancels the excess claim(s), in order to avoid ABANDONMENT. Extensions of this time period may be granted under 37 CFR 1.136, unless the excess claim(s) was presented in a preliminary amendment.

☐ 1. The funds in Deposit Account No. _____ are insufficient to cover the entire fee due. The balance is due within the time period set forth in this notice. See note below regarding the appropriate service charge.

☐ 2. The Credit Card payment to cover the entire fee due to Account _____ **(Card type + last 4 digits ONLY)** was refused. The balance is due within the time period set forth in this notice. See note below regarding the appropriate service charge.

☒ 3. The amendment that includes the excess claim(s) has not been entered, since applicant has failed to remit (or authorize charge to a Deposit Account or Credit Card) the fee as indicated on the attached Patent Application Fee Determination Record (PTO/SB/06). Remittance or authorization is due within the time period set forth in this notice.

☐ 4. The fee submitted in this application is insufficient. A balance of $ _____ is due for presentation of excess claims (37 CFR 1.16(h)-(j) or 1.492(d)-(f)).

☐ 5. Other.

Explanation (*Provide specific details of the required correction in order to assist the applicant. Indicate whether a service charge has been added to the fee due*):

THE AMOUNT OF THE FEE(S) DUE IS SUBJECT TO CHANGE, GENERALLY ON OCTOBER 1 OF EACH YEAR (37 CFR 1.16, 1.21 & 1.492). **THE AMOUNT OF THE FEE(S) DUE IS DETERMINED AS OF THE DATE A COMPLETE REPLY WITH THE APPROPRIATE FEE(S) IS RECEIVED BY THE OFFICE** (37 CFR 1.8 & 1.10). BECAUSE THE AMOUNT DUE IS SUBJECT TO CHANGE, IT IS RECOMMENDED THAT APPLICANT CHECK THE CURRENT FEE SCHEDULE WHICH IS AVAILABLE ON THE USPTO'S WEBSITE AT: ***http://www.uspto.gov/web/offices/ac/qs/ope/fees.htm***

Service Charges: There is a $50 service charge for processing each payment refused (including a check returned "unpaid") or charged back by a financial institution (37 CFR 1.21(m)). There is a $25.00 service charge for each month when the balance of a deposit account is below $1000 at the end of the month (37 CFR 1.21(b)(2)).

Mr. Dorian Evans (571) 272 - 1572

Technical Support Staff (TSS)
**Note to TSS: Please do NOT use this notice if the application is under a final rejection.**

# PATENT APPLICATION FEE DETERMINATION RECORD
Effective December 8, 2004

10/679531

## CLAIMS AS FILED - PART I

| | (Column 1) | (Column 2) |
|---|---|---|
| TOTAL CLAIMS | | |
| FOR | NUMBER FILED | NUMBER EXTRA |
| TOTAL CHARGEABLE CLAIMS | minus 20= | * |
| INDEPENDENT CLAIMS | minus 3 = | * |
| MULTIPLE DEPENDENT CLAIM PRESENT | | ☐ |

* If the difference in column 1 is less than zero, enter "0" in column 2

SMALL ENTITY TYPE ☐ OR OTHER THAN SMALL ENTITY

| RATE | FEE | | RATE | FEE |
|---|---|---|---|---|
| BASIC FEE | 150.00 | OR | BASIC FEE | 300.00 |
| X$ 25= | | OR | X$50= | |
| X100= | | OR | X200= | |
| +180= | | OR | +360= | |
| TOTAL | | OR | TOTAL | |

## CLAIMS AS AMENDED - PART II

| AMENDMENT A | | (Column 1) | | (Column 2) | (Column 3) |
|---|---|---|---|---|---|
| | 3/29/05 | CLAIMS REMAINING AFTER AMENDMENT | | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA |
| | Total | * 23 | Minus | ** 23 | = |
| | Independent | * 2 | Minus | *** 4 | = |
| | FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM | | | | ☐ |

1,29

SMALL ENTITY OR OTHER THAN SMALL ENTITY

| RATE | ADDITIONAL FEE | | RATE | ADDITIONAL FEE |
|---|---|---|---|---|
| X$ 25= | | OR | X$50= | |
| X100= | | OR | X200= | |
| +180= | | OR | +360= | |
| TOTAL ADDIT. FEE | | OR | TOTAL ADDIT. FEE | |

| AMENDMENT B | | (Column 1) | | (Column 2) | (Column 3) |
|---|---|---|---|---|---|
| | 10/11/05 | CLAIMS REMAINING AFTER AMENDMENT | | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA |
| | Total | * 31 | Minus | ** 23 | = 8 |
| | Independent | * 2 | Minus | *** 4 | = — |
| | FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM | | | | ☐ |

| RATE | ADDITIONAL FEE | | RATE | ADDITIONAL FEE |
|---|---|---|---|---|
| X$ 25= | | OR | X$50= | 400 |
| X100= | — — | OR | X200= | |
| +180= | | OR | +360= | |
| TOTAL ADDIT. FEE | | OR | TOTAL ADDIT. FEE | 400 |

| AMENDMENT C | | (Column 1) | | (Column 2) | (Column 3) |
|---|---|---|---|---|---|
| | | CLAIMS REMAINING AFTER AMENDMENT | | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA |
| | Total | * | Minus | ** | = |
| | Independent | * | Minus | *** | = |
| | FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM | | | | ☐ |

| RATE | ADDITIONAL FEE | | RATE | ADDITIONAL FEE |
|---|---|---|---|---|
| X$ 25= | | OR | X$50= | |
| X100= | | OR | X200= | |
| +180= | | OR | +360= | |

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JUL 1 0 2006
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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/679,531 | 10/06/2003 | Hiroto Sugahara | 501558.20003 | 3968 |

26418 7590 12/12/2005

REED SMITH, LLP
ATTN: PATENT RECORDS DEPARTMENT
599 LEXINGTON AVENUE, 29TH FLOOR
NEW YORK, NY 10022-7650

| EXAMINER | |
|---|---|
| MRUK, GEOFFREY S | |
| **ART UNIT** | **PAPER NUMBER** |
| 2853 | |

DATE MAILED: 12/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

DD DOCKET
DUE Jan. 12, 2006 Submit statement re substance of the interview

PTO-90C (Rev. 10/03)

| | | |
|---|---|---|
| **Interview Summary** | **Application No.**<br>10/679,531 | **Applicant(s)**<br>SUGAHARA, HIROTO |
| | **Examiner**<br>Geoffrey Mruk | **Art Unit**<br>2853 |

IPE IAP70 JUL 1 0 2006 PATENT & TRADEMARK OFFICE

All participants (applicant, applicant's representative, PTO personnel):

(1) *Geoffrey Mruk*.

(2) *Manish Shah*.

(3) *Bala Sundararajan*.

(4) _____.

Date of Interview: *08 December 2005*.

Type: a)☒ Telephonic b)☐ Video Conference
c)☐ Personal [copy given to: 1)☐ applicant 2)☐ applicant's representative]

Exhibit shown or demonstration conducted: d)☐ Yes e)☒ No.
If Yes, brief description: _____.

Claim(s) discussed: *Independent claim 1*.

Identification of prior art discussed: *Takuchi et al. (US 5,592,042)*.

Agreement with respect to the claims f)☐ was reached. g)☒ was not reached. h)☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: *The limitations of claim 1 were discussed, specifically "a plurality of first electrodes which are embedded in a first area of one of a first portion and a second portion of the sheet member, such that the first electrodes are separate from each other in the first area". Further consideration and or search will be performed for this application*.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN A NON-EXTENDABLE PERIOD OF THE LONGER OF ONE MONTH OR THIRTY DAYS FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

12/8/05

**MANISH S. SHAH**
**PRIMARY EXAMINER**

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

Examiner's signature, if required

OIPE
JUL 1 0 2006
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# Summary of Record of Interview Requirements

**Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record**
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

**Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews**
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

---

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
    (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

### Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

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OIPE IAP18
JUL 10 2006
PATENT & TRADEMARK OFFICE

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/679,531 | 10/06/2003 | Hiroto Sugahara | 501558.20003 | 3968 |

26418 7590 06/20/2006

REED SMITH, LLP
ATTN: PATENT RECORDS DEPARTMENT
599 LEXINGTON AVENUE, 29TH FLOOR
NEW YORK, NY 10022-7650

| EXAMINER |  |
|---|---|
| MRUK, GEOFFREY S |  |
| **ART UNIT** | **PAPER NUMBER** |
| 2853 |  |

DATE MAILED: 06/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

DOCKET

JLB DUE July 20, 2006 Request TO withdraw Holding AB

OIPE IAP78
JUL 1 0 2006
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# Notice of Abandonment

| | | | |
|---|---|---|---|
| Application No.<br>10/679,531 | | Applicant(s)<br>SUGAHARA, HIROTO | |
| Examiner<br>Geoffrey Mruk | | Art Unit<br>2853 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--*

This application is abandoned in view of:

1. ☒ Applicant's failure to timely file a proper reply to the Office letter mailed on *08 July 2005*.
   (a) ☐ A reply was received on _____ (with a Certificate of Mailing or Transmission dated _____ ), which is after the expiration of the period for reply (including a total extension of time of _____ month(s)) which expired on _____.
   (b) ☐ A proposed reply was received on _____, but it does not constitute a proper reply under 37 CFR 1.113 (a) to the final rejection.
   (A proper reply under 37 CFR 1.113 to a final rejection consists only of: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114).
   (c) ☐ A reply was received on _____ but it does not constitute a proper reply, or a bona fide attempt at a proper reply, to the non-final rejection. See 37 CFR 1.85(a) and 1.111. (See explanation in box 7 below).
   (d) ☒ No reply has been received.

2. ☐ Applicant's failure to timely pay the required issue fee and publication fee, if applicable, within the statutory period of three months from the mailing date of the Notice of Allowance (PTOL-85).
   (a) ☐ The issue fee and publication fee, if applicable, was received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the statutory period for payment of the issue fee (and publication fee) set in the Notice of Allowance (PTOL-85).
   (b) ☐ The submitted fee of $_____ is insufficient. A balance of $_____ is due.
   The issue fee required by 37 CFR 1.18 is $_____. The publication fee, if required by 37 CFR 1.18(d), is $_____.
   (c) ☐ The issue fee and publication fee, if applicable, has not been received.

3. ☐ Applicant's failure to timely file corrected drawings as required by, and within the three-month period set in, the Notice of Allowability (PTO-37).
   (a) ☐ Proposed corrected drawings were received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply.
   (b) ☐ No corrected drawings have been received.

4. ☐ The letter of express abandonment which is signed by the attorney or agent of record, the assignee of the entire interest, or all of the applicants.

5. ☐ The letter of express abandonment which is signed by an attorney or agent (acting in a representative capacity under 37 CFR 1.34(a)) upon the filing of a continuing application.

6. ☐ The decision by the Board of Patent Appeals and Interference rendered on _____ and because the period for seeking court review of the decision has expired and there are no allowed claims.

7. ☒ The reason(s) below:

No reply to the non-final rejection dated 8 July 2005 was filed.

**STEPHEN MEIER**
**SUPERVISORY PATENT EXAMINER**

Petitions to revive under 37 CFR 1.137(a) or (b), or requests to withdraw the holding of abandonment under 37 CFR 1.181, should be promptly filed to minimize any negative effects on patent term.